

THE AQUATIC AND MARSHLAND FLORA OF KHERI DISTRICT, UTTAR PRADESH¹

K. K. SINGH² AND R. P. S. TOMAR³

(With a text-figure)

The paper presents an account of the aquatic and marshy angiosperms of Kheri district, Uttar Pradesh. Topographical and climatic conditions of the area have been described. The whole area of present investigation comprises six main forest ranges and distribution of species along with field numbers is recorded. The present study shows that 179 species of angiosperms belonging to 54 families inhabit the lakes, ponds, swamps, marshes and river banks of the district.

INTRODUCTION

In India the study on hydrophytes and marshland plants has been carried out by a number of workers : Biswas and Calder (1937), Misra (1946), Mirashi (1954, 1957, 1958), Sen and Chatterjee (1959), Subramanyam (1962), Maheshwari (1960) and Vyas (1964) etc. The systematic and ecological studies on aquatic and marshy plants of Kheri district has been undertaken while conducting floristic studies of the forest of the district. The area has been partly botanically explored by Duthie (1923), P. C. Kanjilal (1966) and G. Saran (1954 & 1956) of National Botanical Research Institute Lucknow. However, no separate work on aquatic plants of Kheri district has been published. A thorough study of the present day aquatic and marshland plants is, therefore, necessary. The area was surveyed in different seasons during the years 1972 to 1978. Specimens are preserved in the Medicinal Plant herbarium of Central Drug Research Institute, Lucknow. The order of families followed in this paper is according to Bentham and Hooker's *Genera Plantarum* 1862-63. However, in splitting of certain families, Hutchinson's (ed.

1959, 1973) classification has been adopted. An attempt has been made to bring the nomenclature up-to-date as far as possible.

LOCATION AND HABITATS

Kheri district occupies north-west position in Uttar Pradesh between 27° 41' and 28° 42' N. latitude and 30° 2' and 81° 19' E. longitude. The district is bounded on east by the district of Baharaich, from which it is separated by river Kauriala, on the south by Sitapur and Hardoi, on the west by Shahjahanpur and Pilibhit districts and on the north by the territory of Nepal, separated by Mohan river. The thick forest belts are situated in the terai regions of the foothills of Himalayas in close vicinity of the territory of Nepal. It occupies a total area of 4,740 sq. km. Major parts of the district are provided with permanent ponds, Jheels, riverbeds and marshes which get filled up by water during the rainy season and maintain a rich aquatic and marshland flora. The present study conducted over a greater part of the district with special reference to the following ranges from where the species have been collected.

1. Mailani, 2. Golagokarannath, (3) Dudwa, (4) Bankati, (5) Bellrain, (6) Sonaripur. These ranges have a large number of ponds, ditches, jheels, river banks and marshes which support

¹ Accepted December 1980.

² Botany Division, Central Drug Research Institute, Lucknow.

³ Department of Botany, Y. D. Postgraduate College, Lakhimpur-Kheri.

rich aquatic and marshy vegetation throughout the year. (Fig. 1).

TOPOGRAPHY AND SOILS

In its general aspect, Kheri district occupies large stretches of alluvial plain, covered in the northern half with forests and intersected in between by many rivers and water courses. In general, the slope of the district is from north-

west to south-west. A major portion of the district is low-lying and gets filled with water during the rainy season. Marshlands occur commonly in the district. The district is mainly composed of gangetic alluvium showing a succession of beds of sands and loam, varying in depth according to the configuration of the ground. In areas where clay has been deposited on the surface as in depressions, the ground becomes swampy during the rainy season.

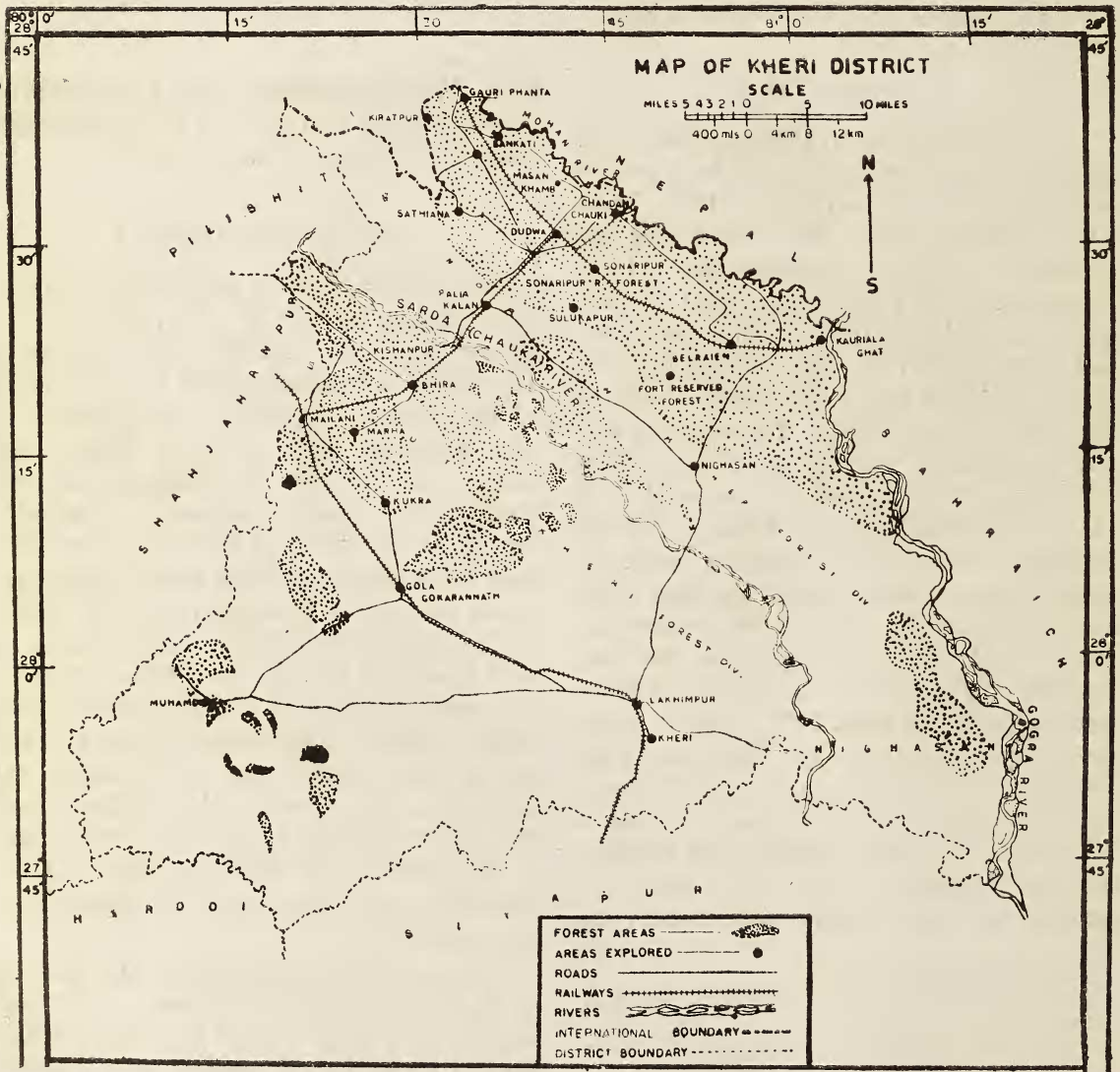


Fig. 1. Map of Kheri District, Uttar Pradesh.

AQUATIC AND MARSHLAND FLORA OF KHERI DISTRICT

CLIMATE

The climate of Kheri district is of monsoon type. The year may be broadly divided into rainy, winter and summer seasons. The average total annual rainfall is about 1159.76 mm. The mean maximum temperature in May reaches as much as 46°C and mean minimum temperature is 8.32°C in the month of December.

OBSERVATIONS

The common habitats of hydrophytes and marshland vegetation are the lakes, ponds, bank of rivers, low-lying areas and marshy places of the district, which remain submerged throughout the year. The following six categories are recognised, depending upon the nature of habitats and their contact with soil, water and air :

1. Free-floating hydrophytes.
2. Suspended hydrophytes.
3. Submerged attached hydrophytes.
4. Floating attached hydrophytes.
5. Emergent, amphibious hydrophytes.
6. Wetland and marshy plants.

The aquatic and marshy vegetation shows some pure patches of plants like *Eichhornia crassipes* (Mart.) Solms, *Nelumbo nucifera* Gaertn., *Monochoria vaginalis* Presl, *Typha angustata* Bory & Chaub, *Potentilla supina* Linn., *Ranunculus sceleratus* Linn. in different localities of the district. Besides, there are number of common associations of aquatic and marshy species which are noticeable in these areas :

Associates of Aquatic plants :

- (a) *Nymphaea*, *Eleocharis*, *Aeschynomene*
- (b) *Potamogeton*, *Ottelia*, *Hygroryza*.
- (c) *Nymphaea*, *Nymphoides*, *Hydrilla*.

Associates of Marshy and Wetland plants :

- (a) *Ludwigia*, *Scirpus*, *Hydrolea*.
- (b) *Caesulia*, *Tenagocharis*, *Sphenoclea*.

- (c) *Phragmites*, *Oxystelma*, *Carex*.
- (d) *Ipomoea*, *Hydrolea*, *Ammannia*.

Plants like *Eclipta prostrata* (Linn.) Linn., *Alternanthera sessilis* (Linn.) D.C. *Ipomoea aquatica* Forsk., *Ammannia baccifera* Linn. show wide range of distribution. The present study shows that one hundred and seventy-nine species of angiosperms belonging to fifty-four families inhabit the lakes, ponds, marshes and river beds of the district.

ENUMERATION OF THE TAXA

1. RANUNCULACEAE

1. *Ranunculus sceleratus* Linn.

Common in marshes of the district. Fl. March to June. Local name *Jaldhania*. KKS 2810, 7266.

2. *R. cantoniensis* DC.

Rare, Bankati range of the district in marshes. Fl. April to May. KKS 7164.

2. NYMPHAEACEAE

3. *Nymphaea nouchali* Burm. f.

Common in ponds and jheels during the rainy season. Fl. August to October. Local name: *Kumodini*, *Kokaveli*. KKS 7440.

4. *Nymphaea stellata* Willd.

Occasional in ponds and lakes, often mixed with *N. nouchali* Burm. f. Fl. August to October. Local name: *Chota Kamal*. KKS 7508, 7696.

3. NELUMBONACEAE

5. *Nelumbo nucifera* Gaertn.

Frequent in jheels and ponds. Fl. April to October. Local name: *Kamal*. KKS 3007,

4. BRASSICACEAE (CRUCIFERAE)

6. *Rorippa indica* (Linn.) Hiern

Occasional in moist shady places. Fl. February to August. KKS 2933, 4306.

7. *Coronopus didymus* (Linn.) Sm.

Frequent in moist places. Fl. January to April. KKS 7792.

5. ELATINACEAE

8. *Bergia ammannioides* Heyne ex Roth

Rare, in wet and marshy places along with *Ammannia* spp. Fl. November to May. KKS 7791.

6. STERCULIACEAE

9. *Melochia corchorifolia* Linn.

Common in muddy and marshy places. Fl. July to September. KKS 7443, 7732.

7. TILIACEAE

10. *Corchorus aestuans* Linn.

Common in moist shady places. Fl. August to October. KKS 3069, 7561.

11. *C. capsularis* Linn.

Frequent on moist ground. Fl. July to September. KKS 3064.

8. FABACEAE (PAPILIONACEAE)

12. *Aeschynomene indica* Linn.

Common in wastelands, ponds and rice fields. Fl. July to October. Local name: *Jhingini*. KKS 2968, 7711.

9. ROSACEAE

13. *Potentilla indica* (Andr.) Wolf.

Occasional in moist shady places and in marshy area. Fl. September to October. KKS 7342, 8365.

14. *P. supina* Linn.

Common throughout the area in marshy and muddy areas. Fl. January to April. KKS 2887, 7103, 8402.

10. MYRTACEAE

15. *Syzygium heyneanum* (Duthie) Wall. ex-Gamble

Occasional on river banks and in swamps. Fl. April to September. Local name: *Kathjamuni*. KKS 7352.

11. LECYTHIDACEAE

16. *Barringtonia acutangula* (Linn.) Gaertn.

Found frequently in marshy places and along river banks. Fl. May to September. Local name: *Panyala*. KKS 4342.

12. LYTHRACEAE

17. *Ammannia baccifera* Linn.

Common in moist and marshy places throughout the area. Fl. major part of the year. KKS 4149, 7219.

18. *A. multiflora* Roxb.

Common in moist and marshy places. Fl. October to January. KKS 4148.

19. *Rotala indica* (Willd.) Koehne

Common in moist and muddy places along forest roads. Fl. October to January. KKS 4180, 7859.

20. *R. mexicana* Cham. & Schlect.

Common on moist and muddy ground along forest roads. Fl. October to December. KKS 4203, 7857.

AQUATIC AND MARSHLAND FLORA OF KHERI DISTRICT

13. ONAGRACEAE

21. *Ludwigia adscendens* (Linn.) Hara

Common in ponds during rainy season. Fl. September to November. KKS 3083, 4368, 7409.

22. *L. prostrata* Roxb.

Frequent in moist and muddy places along forest roads. Fl. August to November. KKS 7538, 7713, 8482.

23. *L. octovalvis* (Jacq.) Raven subsp. *sessiliflora* (Mich.) Raven

Frequent in marshy and water-logged areas. Fl. October to December. KKS 4261, 7887.

24. *L. perennis* Linn.

Common in muddy and shaded areas along forest roads. Fl. September to November. KKS 7413, 7538, 8532.

14. TRAPACEAE

25. *Trapa natans* Linn. var. *bispinosa* (Roxb.) Makino

Commonly cultivated in ponds and jheels in the area. Fl. August to November. Local name : *Singhara*. KKS 7694.

15. MOLLUGINACEAE

26. *Glinus lotoides* Linn.

Common in drying ponds, puddles and moist sandy places. Fl. April to August. KKS 2927.

16. APIACEAE (UMBELLIFERAE)

27. *Hydrocotyle sibthorpioides* Lamk.

Rare in moist and muddy places. Fl. September to November. KKS 7651.

28. *Centella asiatica* (Linn.) Urban

Common in moist, shady places and along river banks. Fl. April to August. Local name : *Brahmi*. KKS 2931, 4223, 7137.

29. *Cnidium monnieri* (Linn.) Cusson

Frequent in open, muddy and marshy places. Fl. April to May. KKS 2938, 7162.

17. RUBIACEAE

30. *Cephalanthus occidentalis* Linn.

Occasional in marshy area along river bank. Fl. March to July. Inayat 22381.

31. *Oldenlandia corymbosa* Linn.

Frequent in moist and muddy places. Fl. September to October. KKS 4168, 4209.

32. *O. paniculata* Linn.

Occasional in moist and marshy places. Fl. August to October. KKS 3039, 7955.

33. *Hyptianthera stricta* W. & A.

Rare in marshy places. Fl. March to May. KKS 7140, 7195.

34. *Borreria articularis* (Linn. f.) F.N. Wils.

Common in marshy places. Fl. August to October. KKS 3012, 7434.

18. ASTERACEAE (COMPOSITAE)

35. *Adenostemma lavenia* (Linn.) O. Ktze. var. *lavenia*.

Common in moist, shady and marshy places. Fl. September to February. KKS 4171, 7938.

35. *Caesulia axillaris* Roxb.

Frequent in marshy places and in rice fields. Fl. September to April. KKS 4255, 4325, 7803.

37. *Dichrocephala integrifolia* (Linn. f.) O. Ktze.

Occasional in moist, shady, and marshy places. Fl. August to October. KKS 4133, 7327.

38. *Centipeda minima* (Linn.) A. Br. & Aschers.

Frequent in moist and muddy places. Fl. October to December. Local name: *Nakchikani*. KKS 2895, 7156.

39. *Cotula anthemoides* Linn.

Occasional in moist and marshy places. Fl. February to March. KKS 4340, 7178.

40. *C. hemisphaerica* (Roxb.) Wall. ex Clarke

Occasional in marshy places. Fl. January to March. KKS 7683.

41. *Cyathocline purpurea* (D. Don) O. Ktze.

Common in marshy places and along river banks. Fl. November to March. KKS 7186, 7227.

42. *Emilia sonchifolia* (Linn.) DC.

Frequent in muddy places and other moist places. Fl. September to November. KKS 7633, 7715.

43. *Eclipta prostrata* (Linn.) Linn.

Common in marshy places. Fl. most part of the year. Local name: *Bhangara*. KKS 7168.

44. *Grangea maderaspatana* (Linn.) Poir.

Common in marshy places and along river banks, puddles etc. Fl. October to March. KKS 2884, 7182, 7589, 8328.

19. CAMPANULACEAE

45. *Lobelia alsinoides* Lamk.

Common in moist and muddy grounds along forest roads. Fl. September to December. KKS 4184, 8511.

46. *Wahlenbergia marginata* (Thunb.) DC.

Frequent in damp places and along river streams. Fl. November to March. KKS 7110, 7128, 7638.

47. *Campanula benthamii* Wall. ex Kitamura

Frequent in moist, shady places and along river banks. Fl. December to March. KKS 2854, 7102, 7105.

20. SPHENOCLEACEAE

48. *Sphenoclea zeylanica* Linn.

Frequent in marshy areas and in rice fields. Fl. August to November. KKS 7482, 8488.

21. PRIMULACEAE

49. *Primula umbellata* (Lour.) Benth.

Occasional in moist, shady places. Fl. December to March. KKS 7104, 7636.

50. *Lysimachia candida* Lindl. subsp. *abovata* R. Kunth

Rare in marshy places. Fl. March to October. KKS 7952.

22. ASCLEPIADACEAE

51. *Oxystelma secamone* (Linn.) K. Schum.

In marshy places and along river banks. Fl. July to November. Local name: *Dudhibel*. KKS 4356, 7492.

23. GENTIANACEAE

52. *Nymphoides indicum* (Linn.) O. Ktze.

Commonly in ponds, Jheels etc. Fl. April to October. KKS 7697, 8340.

53. *Canscora decussata* (Roxb.) Roem & Schult.

Frequent in moist and marshy places. Fl. August to November. KKS 4207, 7850.

AQUATIC AND MARSHLAND FLORA OF KHERI DISTRICT

24. HYDROPHYLLACEAE

54. *Hydrolea zeylanica* (Linn.) Vahl.

Common in marshy places and in rice fields. Fl. September to December. KKS 4270, 7846.

25. CONVULVULACEAE

55. *Volvulopsis nummularia* (Linn.) Roberty

Frequent in muddy places. Fl. August to February. KKS 3052.

56. *Ipomoea aquatica* Forsk.

Common in muddy places near pond. Fl. September to February. KKS 2890, 3082, 4109.

26. SCROPHULARIACEAE

57. *Verbascum chinense* (Linn.) Sant.

Occasional along river banks. Fl. February to April. KKS 8409.

58. *Striga angustifolia* (D. Don) Saldanha.

Occurs near the banks of ponds amongst grasses. Fl. September to November. KKS 7476, 7700.

59. *Lindenbergia macrostachya* (Benth.) Benth.

Rare. Along river banks. Fl. February to May. KKS 7101, 7118, 8393.

60. *Mazus pumilus* (Burm. f.) van Steenis

Frequent along river banks. Fl. September to February. KKS 4251.

61. *M. delavayi* Bonati.

Occasionally in moist places and along river banks. Fl. September to December. KKS 7116, 7637.

62. *Limnophila indica* (Linn.) Druce.

Common in permanent pools, ponds and in marshy places. Fl. September to December. KKS 4275, 4328, 7856, 7870.

63. *Lindernia crustacea* (Linn.) F. Muell.

Occasionally in marshy places. Fl. September to December. KKS 7463, 8464.

64. *L. ciliata* (Colsm.) Pennell.

Frequent in moist and marshy places. Fl. September to December. KKS 7428.

65. *L. anagallis* (Burm. f.) Pennell.

Frequent in moist shady and marshy places. Fl. September to December. KKS 3038, 4146.

66. *Bacopa monnieri* (Linn.) Pennell.

Occasionally in wet and marshy places. Fl. August to November. KKS 3071, 7941.

67. *Mella hamiltoniana* (Benth.) Pennell.

Rare in marshy places. Fl. September to October. KKS 8502.

68. *Veronica anagallis-aquatica* Linn.

Common in marshy places and along river banks. Fl. February to April. KKS 7107, 7232, 8324.

27. LENTIBULARIACEAE

69. *Utricularia aurea* Lour.

Frequent in stagnant water of ponds and ditches etc. Fl. September to December. KKS 7568.

28. ACANTHACEAE

70. *Hygrophila auriculata* (K. Schum.) Heine.

Common in marshy places and near ponds and ditches. Fl. October to December. KKS 2892.

71. *H. salicifolia* (Vahl) Nees.

Occasional in moist and marshy places. KKS 7580.

72. *Hemiadelphus polyspermus* (Roxb). Nees.

Common in marshy places and along river beds. Fl. September to March. KKS 2845, 2895, 7681, 7812, 8329.

29. VERBENACEAE

73. *Phyla nodiflora* (Linn.) Greene

Common in marshy places and along river banks. Fl. April to August. KKS 3075, 4115, 7224.

30. LAMIACEAE (LABIATAE)

74. *Acrocephalus indicus* (Burm. f.) O. Ktze.

Common in moist and marshy places. Fl. September to December. KKS 4165, 7851.

75. *Salvia plebeia* R. Br.

Common in moist places, along river banks and in marshes. Fl. September to April. KKS 2804, 2842, 4138, 7158, 8383.

76. *Eusteralis stellata* (Lour.) Panigrahi.

Frequent in marshy and muddy areas along forest roads. Fl. September to November. KKS 4280, 7809, DP Raturi 2557.

31. AMARANTHACEAE

77. *Centrostachys aquatica* (R. Br.) Wall. ex-Moq.

Rare in ponds. Fl. September to December. KKS 7515.

78. *Alternanthera sessilis* (Linn.) DC.

Common in moist, marshy places and along river banks. Fl. Major part of the year. KKS 3066, 7155.

79. *A. paronychioides* St. Hil.

Common in marshy places and near ponds. Fl. All season. KKS 7259, 7466, 7604.

32. CHENOPODIACEAE

80. *Chenopodium ambrosioides* Linn.

Frequent along river banks. Fl. March to September. KKS 3048, 7329.

33. POLYGONACEAE

81. *Polygonum plebeium* R. Br.

Common in marshy places and near ponds etc. Fl. August to April. KKS 2809, 2814, 7169, 7319.

82. *P. glabrum* Willd.

Frequent in marshy places and along river banks. Fl. September to March. KKS 7828.

83. *P. lanigerum* R. Br.

Common in marshy places. Fl. September to December. KKS 7505, 7884.

84. *P. limbatum* Meissn.

Occasional in marshy places and near ponds. Fl. September to December. KKS 7661, 7976.

85. *P. barbatum* Linn. subsp. *gracile* Dansen.

Common in marshy places and in ditches. Fl. September to March. KKS 2978, 4226, 4303, 7223.

86. *P. hydropiper* Linn. subsp. *microcarpum* Danser var. *lenticularis* Danser.

Occasional in marshy places and in ditches. Fl. September to March. KKS 7559, 8920, 8404, 8471.

87. *Rumex dentatus* Linn.

Common in marshy places and along river beds. Fl. January to June. KKS 2828, 7138, 7593, 8325.

34. PIPERACEAE

88. *Piper longum* Linn.

Common in moist and marshy places in sal forest. Fl. August to October. Local name: *Piper*. KKS 3042, 7963, 8478.

35. EUPHORBIACEAE

89. *Bischofia javanica* Blume.

Rare in moist and marshy places. Fl. March to April. KKS 7911.

90. *Trewia nudiflora* Linn.

Frequent in marshy places. Fl. February to April. Local name: *Gutel*. KKS 2905, 7188, 7655.

91. *Glochidion lanceolarium* Voigt

Frequent in marshy places. Fl. March to April. KKS 3059, 7964.

92. *G. multiloculare* Voigt.

Occasional in marshy places. Fl. March to May. KKS 4304, 8497.

93. *Kirganelia reticulata* (Poir.) Baill.

Frequent in marshy places and along streams. Fl. April to July. KKS 2848, 7130, 7625.

36. URTICACEAE

94. *Pouzolzia zeylanica* (Linn.) Benn.

Frequent along river banks and in moist shady places. Fl. September to January. KKS 2989, 3043, 4170.

95. *P. pentandra* (Roxb.) Benn.

Occasional in moist places along streams. Fl. September to January. KKS 7885.

96. *P. hirta* (Bl.) Hassk.

Rare. Along streams and in moist places. Fl. September to December. KKS 7965.

37. MORACEAE

97. *Ficus heterophylla* Linn. f.

Frequent in marshy places. Fl. October to May. KKS 7258, 7328, 7667, 7954.

38. SALICACEAE

98. *Salix tetrasperma* Roxb.

Frequent along river beds. Fl. October to March. Local name: *Sukulbent*. KKS 2880, 4217, 7986.

39. CERATOPHYLLACEAE

99. *Ceratophyllum demersum* Linn.

Common in lakes, ponds and ditches. Fl. September to November. KKS 2559.

40. HYDROCHARITACEAE

100. *Hydrilla verticillata* (Linn. f.) Royle.

Frequent in tanks and ponds and slowly running water of ditches. Fl. September to November. KKS 8354, 8419.

101. *Ottelia alismoides* (Linn.) Pers.

Common in tanks, ponds and slow running water. Fl. September to December. KKS 7556, 7708.

102. *Vallisneria spiralis* Linn.

Frequent at the bottom of ponds and ditches. Fl. October to March. KKS 8564.

41. PONTEDERIACEAE

103. *Eichhornia crassipes* (Mart.) Solms.

Common in ponds and ditches forming pure patches. Fl. September to November. Local name: *Jalkumbhi*. KKS 7370.

104. *Monochoria vaginalis* (Burm. f.) Presl.

Common in marshy places and along the edge of ponds. Fl. August to November. KKS 7483, 7748, 3489.

42. COMMELINACEAE

105. *Amischophacelus axillaris* (Linn.) R. Rao & Kammathy.

Common in marshy places. Fl. August to December. KKS 4272, 7541.

106. *Cyanotis oristata* (Linn.) D. Don

Frequent in damp and muddy places. Fl. July to November. KKS 4216, 7539, 7819.

107. *Murdannia scapiflora* Roxb.

Occasional in marshy places. Fl. August to November. KKS 4139.

43. JUNCACEAE

108. *Juncus prismatocarpus* R. Br.

Occasional in marshy places. Fl. October to April. Inayat 22831.

109. *J. bufonius* Linn.

Frequent in moist and marshy places. Fl. October to March. G. Saran 26298, 26374.

44. ARECACEAE (PALMAE)

110. *Calamus tenuis* Roxb.

Frequent in marshy areas and along river banks. Fl. September to December. Local name : *Bent*. KKS 7713.

45. TYPHACEAE

111. *Typha augustata* Bory & Chaub.

Common in marshy places. Fl. May to November. Local name : *Pater*. KKS 7652, 7940.

46. ARACEAE

112. *Pistia stratiotes* Linn.

Rare. In still water of tanks and ditches. Fl. August to November. KKS 7830.

113. *Plesmonium margaritifera* Schott

Rare. In marshy places. Fl. August to October. KKS 7745.

47. LEMNACEAE

114. *Lemna paucicostata* Hegelm.

Frequent in ponds and ditches. KKS 8410.

115. *Wolffia arrhiza* (Linn.) Horkel ex-Wimmer

Occasional in ponds and ditches. KKS 8412.

116. *Spirodela polyrhiza* (Linn.) Schleid

Common in still water of ponds and ditches. KKS 8411.

48. ALISMATACEAE

117. *Sagittaria sagittifolia* Linn.

Frequent in marshy places. Fl. September to February. KKS 7353.

118. *S. guayanensis* H. B. & K.

Occasional in marshy places and in ponds. Fl. September to December. KKS 7484, 7695.

119. *Caldesia parnassifolia* (Linn.) Parl.

Rare. In stagnant water of ponds. Fl. July to October. KKS 7555.

49. BUTOMACEAE

120. *Tenagocharis latifolia* (D. Don) Buchen.

Occasional in open marshy places and in rice fields. Fl. September to December. KKS 4334, 7847.

AQUATIC AND MARSHLAND FLORA OF KHERI DISTRICT

50. APONOGETONACEAE

121. *Aponogeton crispum* Thunb.

Frequent in ponds and jheels. Fl. August to November. KKS 7553.

51. POTAMOGETONACEAE

122. *Potamogeton nodosus* Poir.

Occasional in ponds and in marshy places. Fl. November to December. KKS 7268.

123. *P. crispus* Linn.

Frequent in ponds. Fl. December to April. KKS 7245.

124. *P. pectinatus* Linn.

Common in ponds and tanks. Fl. October to April. KKS 7246, 8460.

52. ERIOCAULACEAE

125. *Eriocaulon cinereum* R. Br.

Common in marshy places and in rice fields. Fl. September to January. KKS 7489, 7854.

53. CYPERACEAE

126. *Carex cernua* Boott.

Occasional in marshy places. Fl. February to April. Inayat 22886.

127. *C. fedia* Nees.

Common in marshy places and near ponds etc. Fl. September to April. KKS 2819, 7172, 7660.

128. *Cyperus michelianus* (Linn.) Link subsp. *pygmaeus* (Rottb.) Asch. & Graebn.

Frequent near ponds and marshy places. Fl. October to July. Inayat 23898.

129. *C. triceps* (Rottb.) Endl.

Occasional in moist and marshy places. Fl. September to October. KKS 8568.

130. *C. kyllingia* Endl.

Common in marshy places. Fl. August to March. KKS 2955, 4181, 7418.

131. *C. cyperoides* (Linn.) O. Ktze.

Common in marshy places. Fl. September to November. KKS 3017, 7916, 8470, 8522.

132. *C. compactus* Retz.

Frequent in moist and marshy places. Fl. August to November. KKS 2953, 4271, 7451.

133. *C. platystylis* R. Br.

Occasional in marshy places and along river banks. Fl. July to February. Sis Ram 46453.

134. *C. difformis* Linn.

Occasional in marshy places. Fl. August to December. KKS 8425.

135. *C. silltensis* Nees.

Frequent in marshy places. Fl. August to November. KKS 4362, 7893, 8510.

136. *C. tenuispica* Steud.

Occasional in rice fields and other marshy places. Fl. October to November. KKS 7491.

137. *C. haspan* Linn.

Occasional in marshy places. Fl. September to November. KKS 7889.

138. *C. compressus* Linn.

Frequent in moist and marshy places. Fl. August to November. KKS 8432.

139. *C. iria* Linn.

Common in rice fields and other marshy places. Fl. August to November. KKS 2976, 7472, 8446.

- 140. *C. alulatus* Kern.**
Common in rice fields and in other marshy places. Fl. September to November. KKS 2977.
- 141. *C. niveus* Retz.**
Frequent in moist and marshy places. Fl. July to October. KKS 7387.
- 142. *C. corymbosus* Rottb.**
Frequent in marshy places. Fl. August to November. KKS 8505.
- 143. *C. digitatus* Roxb.**
Frequent in moist shady and marshy places. Fl. August to December. KKS 8472.
- 144. *C. pilosus* Vahl.**
Occasional in marshy places and in rice fields. Fl. August to December. KKS 7557, 7763.
- 145. *C. distans* Linn. f.**
Frequent in moist and muddy places. Fl. August to October. KKS 8459, 8526.
- 146. *C. pangorei* Rottb.**
Frequent in moist and muddy places. Fl. August to January. KKS 8437.
- 147. *C. exaltatus* Retz.**
Common in marshy places. Fl. August to December. KKS 2951, 7452, 7755.
- 148. *Eleocharis dulcis* (Burm. f.) Henschel.**
Frequent in marshy places and in shallow water of ponds and ditches. Fl. September to December. KKS 8426.
- 149. *E. atropurpurea* (Retz.) Kunth.**
Common in marshy places and in rice fields. Fl. September to December. KKS 7488.
- 150. *E. palustris* R. Br.**
Common in marshy places. Fl. October to April. KKS 7664, 8428.
- 151. *Fimbristylis bisumbellata* (Forsk.) Bub.**
Common along river banks and other marshy places. Fl. February to April. KKS 7174, 7241, 7709, 8469.
- 152. *F. dichotoma* (Linn.) Vahl.**
Frequent in muddy places and in rice fields. Fl. July to November. KKS 3045, 4159, 7552.
- 153. *F. littoralis* Gand.**
Common in rice fields and other marshy places. Fl. September to December. KKS 8455.
- 154. *Scirpus affinis* Roth.**
Frequent in marshy places. Fl. February to May. KKS 7323, 8329.
- 155. *S. michelianus* Linn.**
Occasional in marshy places. Fl. September to November. Inayat 22864.
- 156. *S. articulatus* Linn.**
Frequent in marshy and muddy places. Fl. September to November. KKS 4295, 7351.
- 157. *S. mucronatus* Linn.**
Occasional in muddy places. Fl. September to November. KKS 8338.
- 158. *S. tuberosus* Desf.**
Occasional in marshy places. Fl. September to December. Inayat 22872, 22866 (DD).

54. POACEAE (GRAMINEAE)

159. *Saccharum spontaneum* Linn.

Frequent in marshy places and along river banks. Fl. September to January. KKS 3028, 7500.

- 160. *Ischaemum rugosum* Salisb.**
Common near ponds and marshy places. Fl. September to December. KKS 7945, 8423.
- 161. *Hemarthira compressa* (Linn. f.) R. Br.**
Common in marshy places and in rice fields. Fl. July to September. KKS 8440, 8467.
- 162. *Rottboellia exaltata* Linn. f.**
Frequent near ponds and along streams. Fl. August to November. KKS 7951.
- 163. *Mnesithea laevis* (Retz.) Kunth.**
Frequent in marshy places and in rice fields. Fl. July to December. KKS 7707.
- 164. *Vetiveria zizanioides* (Linn.) Nash.**
Common in marshy places. Fl. July to November. Local name : *Seenk*. KKS 2983, 7505, 7550, 7764.
- 165. *Bothriochloa pertusa* (Linn.) A. Camus**
Frequent in marshy places. Fl. September to January. KKS 8540, 8551.
- 166. *Panicum austroasiaticum* Ohwi.**
Frequent near ponds and other moist places. Fl. September to December. KKS 8524.
- 167. *P. trypheron* Schult.**
Frequent in moist and muddy places. Fl. August to December. KKS 7722.
- 168. *P. paludosum* Roxb.**
Common in marsh lands, still water, and banks of ponds. Fl. September to December. KKS 7730, 8473, 8563.
- 169. *Hymenachne pseudointerrupta* C. Muell.**
Occasional in marshy places and in water-logged areas. Fl. September to December. KKS 7874.
- 170. *Echinochloa stagnina* (Retz.) P. Beauv.**
Common in stagnant ditches and banks of ponds. Fl. August to December. KKS 7824, 8501.
- 171. *E. colonum* (Linn.) Link.**
Common in rice fields and other marshy places. Fl. July to November. KKS 7523, 8417.
- 172. *E. crusgalli* (Linn.) Beauv.**
Common in moist places, ponds and in rice fields. Fl. August to November. KKS 7761.
- 173. *Paspalidium flavidum* (Retz.) A. Camus**
Common in marshy places and in rice fields. Fl. July to November. KKS 7886, 8424, 8442, 8505.
- 174. *Paspalum distichum* Linn.**
Common in marshy places and in still waters of ponds, ditches etc. Fl. July to September. KKS 7417, 8427.
- 175. *P. commersonii* Lamk.**
A weed in rice fields. Fl. September to January. KKS 2988.
- 176. *Brachiaria reptans* (Linn.) Gard. & Hubb.**
Frequent in marshy places and in rice fields. Fl. September to January. KKS 8459.
- 177. *Phragmites maxima* (Forsk.) Blatt. & McC.**
Common in marshy places and along streams beds. Fl. December to January. KKS 2818, 2997, 4229, 7240, 7498.
- 178. *Hygroryza aristata* (Retz.) Nees ex-W. & A.**
Common in ponds, ditches etc. Fl. October to February. KKS 7454.

179. *Oryza rufipogon* Griff.

Common in rice fields and other marshy places. Fl. October to November. KKS 7746, 8487.

ACKNOWLEDGEMENTS

We are grateful to Dr. Nitya Nand, Director and Dr. M. M. Dhar, Scientist-in-Charge,

Botany, Central Drug Research Institute, Lucknow for the facilities provided during this investigation and to Dr. J. K. Maheshwari, Sr. Assistant Director, N. B. R. I. for going through the manuscript. One of us (R.P.S.T.) is also thankful to the Principal, Y. D. Post-Graduate College, Lakhimpur-Kheri for facilities.

REFERENCES

BISWAS, K. AND CALDER, C. (1937): Handbook of Common Water and Marsh Plants of India and Burma. Delhi.

DUTHIE, J. F., (1923): Flora of the upper Gangetic Plain and of the adjacent Siwalik and Sub-Himalayan tracts I & II. (repr. ed. 1960)

MAHESHWARI, J. K. (1960): The vegetation of Marshes, Swamps and Riverside in Khandwa district, M. P. *J. Bombay nat. Hist. Soc.* 57 : 371-387.

MIRASHI, M. V. (1954): Studies on the Hydrophytes of Nagpur. *J. Indian bot. Soc.* 33 : 298-308.

MISRA, R. D. (1946): The Ecology of low lying lands. *Indian Ecol.* 1 : 1-20.

PAUL, S. R. (1973): On the aquatic and marsh plants of Monghyr, Bihar. *Botanique* 4 no. 2, 140-151.

SEN, D. N. AND CHATTERJEE, U. N. (1959): Ecological studies on aquatic and swampy vegetations of Gorakhpur. A Survey. *Agra Univ. J. Research (Sci.)* 8 : 17-29.

SUBRAMANYAM, K. (1962) Aquatic Angiosperms. C.S.I.R. New Delhi.

TRIVEDI, B. S. AND SHARMA, P. C. (1965): Studies on the hydrophytes of Lucknow and environs. 1. Distribution and habit, with reference to ecological classification. *Proc. Nat. Acad. Sc. India.* 35 : 1-14.

VYAS, L. N. (1964): A study of the hydrophytes and marsh plants of Alwar and environs. *J. Indian bot. Soc.* 43 : 17-30.